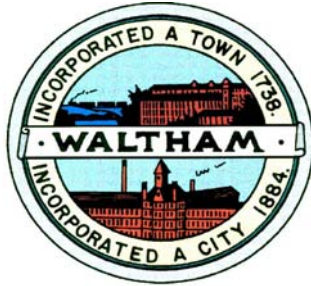


The City of Waltham



**Invites
Interested Parties
To propose the best offer and or bid
For the service or product herewith described:**

WCAC TV Studios Equipment and Installation

The bid opening will be held: Monday July 21, 2014 at 10:00 AM

Pre-Bid Meeting and Site Inspection: Tuesday July 15 , 2014 at 10:00 AM

(Please meet at Waltham City Hall 610 Main Street)

Last Day for Written Questions: 12 Noon Wednesday July 16, 2014

Phone: 781-314-3244, Fax: 781-314-3245

Invitation to Bid

The City of Waltham

Purchasing Department

REQUEST FOR BID (RFB)

Under the rules of M.G.L. Chapter 30B, the Chief Procurement Officer of the City of Waltham Purchasing Department hereby requests sealed bids for:

WCAC TV Studios Equipment and Installation

Price Proposals will be received at the office of the Purchasing Agent, City Hall, 610 Main Street, Waltham MA 02452, until,

The bid opening will be held: Monday July 21, 2014 at 10:00 AM

At which time and place the bids will be publicly opened and read.

Pre-Bid Mtg. and Site Inspection: Tuesday July 15, 2014 at 10:00 AM

(Please meet at Waltham City Hall 610 Main Street)

Last day for written Questions: 12 Noon Wednesday July 16, 2014

All written questions, by the established deadline, must be directed only to : Jpedulla@city.waltham.ma.us

Specifications and information available on line by visiting the Waltham Purchasing Department web site at www.city.waltham.ma.us/open-bids

BIDS MUST BE SIGNED AND ENCLOSED IN A SEALED ENVELOPE AND MARKED:

BID FOR: WCAC TV Studios

A 5% Bid Bond or Certified Check must accompany each bid submitted and made payable to, and become the property of the City of Waltham, if the successful bidder refuses or neglects to comply with the terms of the Contract.

If the Bidder is a corporation, state your correct corporate name and State of incorporation. If Bidder is a partnership, state names and addresses of partners. If Bidder is a trust or other legal entity, state correct names and addresses of trustees or names and address of those legally authorized to bid and enter into contracts.

EXCEPTION OR ALTERNATES TO SPECIFICATIONS, TERMS OF SALE, AND DISCOUNTS AVAILABLE, MUST BE INCLUDED IN THE BID PRIOR TO OPENING DATE.

Intent of Project

The City of Waltham wishes to purchase TV Studio Equipment and Its installation at a number of locations throughout the City

AGREEMENT

CITY OF WALTHAM

ARTICLE 1. This agreement, made this _____ day of _____, 2014 by and between the CITY OF WALTHAM, party of the first part, hereinafter called the CITY, by its MAYOR, and

hereinafter called the CONTRACTOR.

ARTICLE 2. Witnesseth, that the parties to this agreement, each in consideration of the agreement on the part of the others herein contained, do hereby agree, the CITY OF WALTHAM for itself, and said contractor for his heirs, executors, administrators and assigns as follows:

To furnish all equipment, machinery, tools and labor, to furnish and deliver all materials required to be furnished (except as otherwise specified) and deliver in and about the project and to do and perform all work in strict conformity with the provisions of this Contract and of the Notice to Bidders, bid, Project Manual, and Drawings hereto annexed. The said Notice to Bidders, bid, Project Manual, and Drawings are hereby made a part of this contract as fully and to the same effect as if the same had been set forth at length and incorporated in the contracts.

ARTICLE 3. In consideration of the foregoing premises the CITY agrees to pay and the CONTRACTOR agrees to receive as full compensation for everything furnished and done by the CONTRACTOR under this contract, including all work required by not included in the items herein mentioned, and also for all loss or damage arising out of the nature of the work aforesaid, or from the action of the elements, or from any unforeseen obstruction or difficulty encountered in the prosecution of the work, and for all expenses incurred by or in consequence of the suspension or discontinuance of the work specified, and for well and faithfully completing the work, and the whole thereof, as herein provided, such prices as are set forth in the accompanying bid.

All documents submitted for this bid, as reference, will become part of the agreement.

Date for final completion of the project is 90 days from the date of the Notice-to-Proceed (NTP).

This Agreement entered into as of the day and year first written above.

CITY OF WALTHAM, MASSACHUSETTS

FOR THE CITY

Jeannette A. McCarthy, MAYOR,
City of Waltham
Date: _____

John B. Cervone, City Solicitor
Date: _____
APPROVED AS TO FORM ONLY

Maria Sheehan, WCAC Exec. Director
Date: _____

Joseph Pedulla, Purchasing Agent
Date: _____

Paul Centofanti, Auditor
Date: _____

I CERTIFY THAT SUFFICIENT FUNDS
ARE AVAILABLE FOR THIS CONTRACT

FOR THE COMPANY

CONTRACTOR (Signature),
Date: _____

Company

Address

Instructions

INSTRUCTIONS FOR BIDDERS

1. READ ALL DOCUMENTS.

Bidders should familiarize themselves with all the documents contained herein; it is mandatory that all Bids be in compliance with all the provisions contained in said documents.

2. FORMS AND ATTACHMENTS.

Bids are to be completed on the forms provided ONLY and enclosed in a sealed envelope marked on the outside "BID (title)" and the name and address of bidder. Attachments submitted in addition to the Waltham Purchasing Department produced forms may not be considered.

3. PRINTED OR TYPED RESPONSE.

All information must be typewritten or printed in ink, including the price the bidder offers in the space as provided on the bid form.

4. CORRECTIONS.

Bids that are submitted containing cross outs, white outs or erasures, will be rejected. All corrections or modifications to the original bid are to be submitted in a separate envelope, properly marked on the outside, "CORRECTION/ MODIFICATION TO BID (title)" and submitted prior to the bid opening.

ALL DOCUMENTS SUBMITTED WITH YOUR RESPONSE WILL BE INCORPORATED INTO THE CONTRACT.

5. PRICE IS ALL INCLUSIVE.

Bid prices shall encompass everything necessary for furnishing all items, materials, supplies or services as specified, and in accordance with the specifications, including proper packing, cost of delivery, and in the case of services, completion of same, as per specifications.

6. PRICE DISCREPANCY.

In the event of a discrepancy between the Unit Price and the Extension, the Unit Price shall prevail.

7. EXPLANATIONS, EXCEPTIONS

Explanations, exceptions or other information pertinent to the specifications may be made in writing and included in the same envelope with the bid.

8. BID DEPOSITS.

Bid deposits are to be made payable to the City of Waltham. In the event that the successful bidder fails to execute a Contract within (10) days of the receipt of said contract, such security shall be retained by the city as liquidated damages. Unsuccessful bidders' deposits will be returned immediately following the award to said successful bidder.

9. WITHDRAW.

A Bid may be withdrawn by written request prior to the schedule for the Bid Opening. No withdrawals are permitted after the bid opening date and time. Withdrawals after the bid opening date will cause the forfeit of the bid Deposit.

10. AWARD.

Bids will be awarded not later than (90) ninety days after the scheduled bid opening date, unless otherwise stated, in the specifications. Unless otherwise specified, bids will be evaluated on the basis of, completeness of your RFP response, responsiveness, responsibility, best price and experience.

11. AWARD CRITERIA.

Qualified and responsive proposals will be evaluated based on Price, Technical, and Compliance requirements

12. DISCOUNTS.

Discounts for prompt payments will be considered when making awards.

13. TAX EXEMPT.

Purchases by the City of Waltham is exempt from any Federal, State or Massachusetts Municipal Sales and/or Excise Taxes.

14. SAMPLES.

The City of Waltham may require the submission of samples either before or after the awarding of a contract. Samples are to be submitted, at no charge to the City, so as to ascertain the product's suitability. If specifically stated in the Bid that samples are required, said samples must be submitted with the Bid prior to the Official Bid Opening. Failure to submit said samples would be cause for rejection of Bid. All samples must be called for and picked up within (30) thirty days of award or said samples will be presumed abandoned and will be disposed of.

15. ACTIVE VENDOR LIST.

Vendors who wish to remain on the Active Bid List must either submit a Bid, No Bid, or a letter requesting same, no later than the Official Bid Opening. This is applicable to those vendors who have received the Invitation to Bid.

16. FUNDS APPROPRIATION.

THE CONTRACT OBLIGATION ON BEHALF OF THE CITY IS SUBJECT TO PRIOR APPROPRIATION OF MONIES FROM THE GOVERNMENTAL BODY AND AUTHORIZATION BY THE MAYOR.

17. THE AWARDING AUTHORITY RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS, OR ANY PART OF ANY BID, WHICH IN THE OPINION OF THE AWARDING AUTHORITY, IS IN THE BEST INTERESTS OF THE CITY OF WALTHAM.

18. THE TAX ATTESTATION CLAUSE, CERTIFICATION OF NON-COLLUSION AND THE CERTIFICATE OF VOTE AUTHORIZATION, are required by statute and are an integral part of the Invitation for Bid and must be completed and signed by the person submitting the Bid, or by the

person/persons who are officially authorized to do so. Failure to do so may disqualify the bid.

19. STANDARD OF QUALITY.

Where, in the specifications, one certain kind, type, catalog number, brand or manufacturer of material is named, it shall be regarded as the required standard of quality. Where two or more are named, these are presumed to be equal and the Bidder may select one or the other. If the Bidder proposes to offer a substitute as an equal, he shall so indicate on the Bid Form, the kind, type, catalog number, brand, or manufacturer of material that is offered as an equal, and describe where it differs from the specifications. Substituted items must be capable of performing all the functions and/or operational features described or indicated in the specifications. Failure to indicate the description of any substitute item on the Bid will be interpreted to mean that the Bidder will furnish the item or service as specified.

20. MODIFICATION.

No agreement, understanding, alteration or variation of the agreement, terms or provisions herein contained shall bind the parties, hereto unless made and executed in writing by the parties hereto.

21. ASSIGNMENT.

The final payment for work done under this Contract shall be made only after the Contractor has signed a statement under the penalty of perjury, certifying that he has completed the work described in the final estimate. Neither party hereto shall assign this Contract or sublet it in part or as a whole without the prior written consent of the other party hereto. The Contractor shall not assign any sum or sums due or becoming due to him hereunder without the prior written consent of the City.

22. DELIVERIES:

a) The Contractor shall pay all freight and delivery charges. The Waltham Purchasing Department does not pay for shipping and packaging expenses. Items must be delivered as stipulated in the specifications. All deliveries must be made to the inside of city buildings. Sidewalk deliveries will not be accepted. City personnel are not required to assist in the deliveries and contractors are cautioned to notify their shippers that adequate assistance must be provided at the point of delivery, when necessary.

b) All items of furniture must be delivered inside the building, set up, in place and ready for use. Deliveries are to be made between the hours of 8:30 a.m. and 3:00 p.m., Monday through Friday, except on holidays.

c) All damaged items, or items which do not comply with specifications will not be accepted and title therefore will not vest to the Waltham Purchasing Department until such items are accepted and signed for, in good order, by the receiving department.

d) The contractor must replace, without further cost to the Waltham Purchasing Department, such damaged or non-complying items before payment will be made.

23. LABELING.

All packages cartons or other containers must be clearly marked with (a) building and room destination; (b) description of contents of item number from specifications; (c) quantity; (d) City of Waltham Purchase Order Number and (e) Vendor's name and order number.

24. GUARANTEES.

Unless otherwise stipulated in the specifications, furniture, equipment and similar durable items shall be guaranteed by the contractor for a period of not less than one year from the date of delivery and acceptance by the receiving department. In addition, the manufacturer's guarantee shall be furnished. Any items provided under this contract which are or become defective during the guarantee period shall be replaced the contractor free of charge with the specific understanding that all replacements shall carry the same guarantee as the original equipment. The contractor shall make such replacement immediately upon receiving notice from the Purchasing Agent.

25. SINGLE VENDOR.

The Waltham Purchasing Department desires to award a single contract based on the Grand Total Price. However, where applicable, the City reserves the right to make multiple awards on a unit price basis if, in the opinion of the Waltham Purchasing Department, it is in the best interest of the Waltham Purchasing Department.

26. CHANGE ORDERS.

Change orders are not effective until, if, as and when signed by the Mayor and no work is to commence until the change orders are fully executed.

28. BID OPENING INCLEMENT WEATHER

If, at the time of the originally scheduled bid opening, City Hall is closed to inclement weather or another unforeseeable event, the bid opening will be extended until 2:00 PM on the next normal business day. Bids will be accepted until that date and time.

GENERAL CONDITIONS

GENERAL CONDITIONS

1. **INFORMATION**

All information during the bid process shall come from the Office of the City Purchasing Agent. No communication is to be exchanged with any other city official and or its agents. The Contractor shall inquire at this office for any information needed. Wherever the words "or equal as approved" are used, it is to be understood that the opinion of the City Purchasing Agent shall govern.

2. **SUITS**

The Contractor shall assume defense of and shall indemnify and hold the City and its agents harmless from all suits and claims against the City and its sub-contractors arising from the use of any invention, patent right labor or employment, or from any act of omission or neglect of the City, its agents, employees or any subcontractor in performing the work, under this contract.

3. **LAWS AND REGULATIONS**

The Contractor shall conform to all the applicable rules, regulations, laws and ordinances of the City of Waltham, the Commonwealth of Massachusetts, the United States of America and all agencies having jurisdiction over this contract.

4. **PROTECTION OF PROPERTY**

The Contractor shall take all proper precautions to protect the City's property from damage and unnecessary inconvenience. Any City property damaged by the Contractor in carrying out the provisions of this contract shall be restored to its original condition, by and at the expense of the Contractor.

5. **PROTECTION OF PERSONS**

The Contractor shall take all proper precautions to protect persons from injury, unnecessary inconvenience, and shall be responsible for his failure to do so. The Contractor agrees to hold the City harmless from any and all liabilities of every nature and description, which may be suffered through bodily injury, including death, to any person, by reason of negligence of the Contractor, his agents or employees, or any subcontractor.

6. **CONTRACT DURATION.**

This contract is for the period required to complete the project notwithstanding any guarantees

7. **INSURANCE**

A. **WORKMAN'S COMPENSATION:** The Contractor shall provide insurance for the payment of compensation and furnishing of other benefits under Chapter 152 of the General Laws of the Commonwealth of Massachusetts to all persons to be employed under this contract, the premiums for which shall be paid by the Contractor.

Contractors shall provide insurance on a primary basis and the contractor's policy shall be exhausted before resorting to other policies. The contractor's policy is the primary one not the contributory.

B. **COMPREHENSIVE GENERAL LIABILITY**

Bodily Injury: \$1,000,000 Each Occurrence

| | | |
|------------------|--------------------------------|-----------------------------|
| | | \$2,000,000 Aggregate |
| Property Damage: | | \$1,000,000 Each Occurrence |
| | | \$2,000,000 Aggregate |
| C. | AUTOMOBILE (VEHICLE) LIABILITY | |
| | Bodily Injury | \$2,000,000 Each Occurrence |
| | Property Damage | \$1,000,000 Aggregate |
| D. | UMBRELLA POLICY | |
| | General liability | \$1,000,000 |

Your bid response must include a Certificate of Insurance with the above limits as a minimum. In addition, the Certificate of Insurance must have the following text contained in the bottom left box of the Certificate: *"The City of Waltham is a named additional insured for all insurances under the contract, excluding Automobile and Workers Compensation coverage"*. Failure by the contractor to provide a current and updated insurance policy, during the entire duration of the contract, may result in additional legal liability. The Certificate of Insurance must be mailed directly to:

Office of the Purchasing Agent
Purchasing Department
City of Waltham
610 Main Street
Waltham, MA 02452

8. LABOR AND MATERIALS BOND

The Contractor agrees to execute and deliver to the City, a Labor and Materials or Payment Bond equal to 100% of the contract value. This contract shall not be in force until said bond has been delivered and accepted by the City. Bond to be issued by a company licensed by the Commonwealth of Massachusetts.

A LETTER FROM A SURETY COMPANY CERTIFYING THAT THE CONTRACTOR IS QUALIFIED AND CAPABLE OF OBTAINING THE ABOVE BONDS MUST BE INCLUDED WITH HIS/HERS BID.

9. PERSONNEL:

The Contractor shall employ a competent supervisor and all properly licensed personnel necessary to perform the services required in this contract. The City Purchasing Agent shall have the right to require the Contractor to remove and/or replace any of the personnel for nonperformance or for unprofessional behavior. The City Purchasing Agent may require the Contractor to submit a weekly performance record of the areas and of the work performed, on forms approved by the City Purchasing Agent. The Contractor or his supervisor shall be available to inspect such work as required by the City Purchasing Agent.

10. PREVAILING WAGES

The Contractor is required to pay the prevailing wages as determined under the provisions of Chapter 149, Sections 26 and 27D of the Massachusetts General Laws, including the submission of weekly payrolls to the awarding authority. A copy of the prevailing wage schedule can be found at www.city.waltham.ma.us/open-bids

11. MATERIALS

The City or its Agent reserves the right to approve or reject any supplies, material or equipment used by the Contractor. The Contractor agrees to replace any supplies, material or equipment used by the Contractor. The Contractor agrees to replace any rejected supplies, materials or equipment, to the satisfaction of the City or its Agents.

12. TERMINATION OF CONTRACT

This contract may be terminated by the City upon deliverance to the Contractor of a five-day written notice of said termination.

13. CONTRACT OBLIGATIONS

Contract obligations on behalf of the City are subject to an annual appropriation to cover the contract obligation.

14. BIDDER EXPERIENCE EVALUATION

Each bidder shall submit with his bid, all the information relative to their experience and qualifications in performing the work required under this contract and shall have been in business for a minimum of five (5) years, in order for their bid to be considered.

15. NOT-TO-EXCEED AMOUNT

The bid amount proposed in your company's response is a "not-to- Exceed" amount unless the City makes changes, in writing, to the scope of work to be performed. The Change Order must be signed and approved by the City's Purchasing Agent, City Auditor, Law Department and the Mayor prior to the commencement of the change order work. No work is to begin until the proper approvals have been obtained. A change order will be priced at the unit price. Failure to comply with this procedure will result in the cancellation of the contract and the non-payment of services provided

16. FINANCIAL STATEMENTS.

The City may require, within five (5) days after the bid opening, a complete and detailed Financial Statement prepared by a Certified Public Account, to determine a bidder's financial stability.

17. BREACH OF CONTRACT/ NON PERFORMANCE

If the Contractor shall provide services in a manner, which is not to the satisfaction of the City, the City may request that the Contractor refurnish services at no additional cost to the City until approved by the City. If the Contractor shall fail to provide services, which are satisfactory to the City, the City in the alternative may make any reasonable purchase or Contract to purchase services in substitution for those due from the Contractor. The City may deduct the cost of any substitute Contract for nonperformance of services together with incidental and consequential damages from the Contract price and shall

withhold such damages from sums due or to become due to the Contractor. If the damages sustained by the City exceed sums due or to become due, the Contractor shall pay the difference to the City upon demand. The Contractor shall not be liable for any damages sustained by the City due to the Contractor's failure to furnish services under the terms of this Contract if such failure is in fact caused by the occurrence of a contingency the nonoccurrence of which was a basic assumption under which this Contract was made, including a state of war, embargoes, expropriation of labor strike or any unanticipated federal, state or municipal governmental regulation of order, provided that the Contractor has notified the City in writing of such cause within seven (7) days after its occurrence.

18. RIGHT TO AUDIT

The City of Waltham has the right to review and audit documents related to this contract. This right extends to any subcontractor, supplier or other entity used by the prime contractor to fulfill the obligations under this contract.

19. CITY ORDINANCE. APPROVAL OF CONTRACTS BY MAYOR, SEC. 3-12 OF THE CITY ORDINANCES.

All contract made by any department, board or commission where the amount involved is two thousand dollars (\$2,000) or more shall be in writing, and no such contract shall be deemed to have been made or executed until the approval of the Mayor is affixed thereto. Any construction contract shall, and all other contracts may, where the contract exceed five thousand dollars (\$5,000) be required to be accompanied by a bond with sureties satisfactory to the Mayor.

20. PAYMENT SCHEDULE.

The contractor shall be paid for completed work and/or delivered materials according to the following schedule: up to 30% at the time of the schematic acceptance, up to 30% at the delivery of equipment, up to 30%, at the acceptance of the project. The City shall retain 5% for material and 5% for labor. This amount will be paid no later than 30 days following acceptance by the City. The contractor is required to produce invoices before payments are made.

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal

Specifications

Waltham Community Access Corporation
WCAC-TV/MAC-TV UPGRADE TO HD OVERVIEW

The Waltham Community Access Corporation, which provides Public and Government Access television to the city of Waltham, MA will be upgrading the majority of its studio/playback/field/government studios equipment to HD. We will not have the ability to go, "Live" from our remote sites using HD. We will continue "Live" on SD, but will record HD for playback on RCN/HD. We currently air our SD channels on RCN, Comcast and Verizon. We will be moving the playback system from the High School (Education Channel) to WCAC.

This bid is broken down into 4 separate sections.

1. Government Control Rooms

(5 Rooms need to be upgraded) 3 of the large rooms will be essentially identical and the 2 smaller rooms will also be identical. The smaller rooms will have control rooms build into mobile carts. We require plates built into the walls for connection of the cameras and audio to the control panel in the cart.

2. Video Playback Server

This system will run all three standard definition channels and one, "best of" HD Channel on RCN. You will need to relocate the school playback (WETV) system from the High School to the WCAC studio playback server. Tightrope Carousel Digital Signage for all three channels will be integrated into the new system. We will need to add an HD Tightrope Carousel Digital Signage system for the HD channel. We will be building a new server room at WCAC. All electrical and HVAC will be done by city contractors and will not need to be added to this bid. Please consider that your time to consult with the city must be taken into consideration when writing up your bid.

3. WCAC-TV Control Room/Studio

Upgrade the studio cameras, tripods, the switcher, record deck, and teleprompter computer with software. In the studio add more lights and one section of cyclorama

4. WCAC/MAC Channel field Equipment

Upgrade Cameras and Tricaster to HD. We will also be purchasing a portable intercom system.

When putting your bid together, please keep in mind that all electrical wiring and HVAC work will be done by a City of Waltham contractor. ALL TV STUDIO CABLING WILL BE THE RESPONSIBILITY OF THE SELECTED CONTRACTOR.

Our control room currently has a Broadcast Pix switcher, which we will be upgrading. For ease of operator training, all other switchers in this bid(s) must operate in a similar way as our control room. We need to be able to train volunteers on one system.

We will be upgrading our current field TriCaster to HD. Our current mobile cart can be repurposed here.

1. Government Control Rooms - Overview

1. City Hall Chambers, Waltham City Hall, 610 Main St.

(4) Robotic cameras, switcher/camera controls, graphic generator, record decks, video monitoring, DVD recorder. We will need to be able to use the output of a computer that feeds the projector for presentations in the production switcher. This site will go, "Live" in SD on RCN, Verizon and Comcast. HD will be recorded for later playback.

2. Hoover Room, Waltham City Hall, 610 Main St.

(3) Robotic cameras, remote switcher/camera control, record deck, and audio.

Microphones may need to be ceiling mics (preferred).

Production system must be built into mobile cart and signal connections made to a wall plate for access of cameras and audio.

3. Auditorium, Government Center, 119 School St.

(3) Robotic cameras (one of the camera will be on tripod), switcher/camera controls. We feel that the current microphones do not need replacement, however there is a hum in one of the inputs that will need to be eliminated. We need record decks and lighting. The stage is dark (the stage has lights, but are too bright in comparison to the room which is lit by small chandeliers. A couple of lights will need to be added.

4. Meeting Room, Government Center, 119, School St.

(2) Robotic cameras, remote switcher/camera controls, record deck, and audio. Production system must be built in a mobile cart and signal connections made to a wall plate for access of cameras and audio.

5. Cannon Lecture Hall, Waltham High School, 617 Lexington St.

(3) Robotic cameras, switcher/camera controls, record deck, and monitors. There will be 4 video monitors for viewing computer presentations only. These presentations also need to be available in the production switcher and streamed on the internet or internal school web page. The microphones must be able to be muted by the committee members in the auditorium (similar to what is currently done at the City Hall chambers). This room will also have to record an SD DVD. HD Record for later playback, SD "Live" signal on RCN, Verizon and Comcast

Rooms 1, 3 and 5 should mirror each other. All equipment should be relatively the same. Rooms 1 & 5 will send a "Live" SD signal to RCN, Comcast and Verizon.

Numbers 2 & 4 should mirror each other. The production system will be built into a mobile cart that will connect to plates in the walls. All equipment should be relatively the same. Rooms, 2, 3 and 4 do not have to go, "Live". We will record for playback at a later date. We need to be able to record on HD for later playback on our HD channel and also an SD DVD must be recorded for copy requests from residents and the city.

The following is a list of equipment that fits the specifications that we want for each room. All equipment must meet the specs of the equipment listed or better. Detailed as-built system drawings for all areas you have installed must be provided to WCAC

City Hall Chambers, Waltham City Hall, 610 Main St.

- (4) Panasonic AW-HE120SN/SE cameras, cables, batteries, and adapters
- Broadcast Pix Mica with 1000 Panel all controls, monitors, cables and adapters. We will use this unit to control our cameras
- AJA KiPro Portable Recorder
- Sony VRDMC6 DVD Burner
- Ensemble Designs BE41 analog DA or similar for Black Burst distribution of Reference Output from Broadcast Pix Mica to the four Panasonic cameras.
- Ensemble Designs BE920M HD-SDI to analog NTSC converter or similar. Used to convert an HD-SDI output to analog composite NTSC.
- Re-use existing Extron video DA for distribution of analog NTSC program from the analog composite output of the BE41.
- Ensemble Designs rack mount kit BERKMT or similar.

- Ensemble Designs Brighteye Individual Power Supplies (2) if not already supplied.
- 2x Aphex 120B Audio DA or similar. Distributes mixer program to KiPro analog in, fiber transmitter and DVD recorder (set output gain for feed to DVD recorder FCCW for 10db loss. Use XLR to RCA adapter cable to feed recorder). Mica balanced outputs can be fed to mixer as desired.
- Aphex rack mount kit for 120B or similar.
- Add audio "Y" adapter to split the new existing wireless handheld mics feeding the room PA mixer to feed a spare input of the production mixer.
- HD monitors for cameras. Marshall V-MD434-3GSDI quad HD monitor, Marshall mlynx 702 dual or similar. Must have SDI loop-through to feed switcher inputs.
- Computer video to SDI conversion: Convert presenter computer VGA or DVI video output to HDMI and then use HDMI extenders (re-use existing VGA DA is possible). Need scan converter that converts VGA, DVI, or HDMI to SDI. Possibly use Kramer VP790 presentation converter or similar.
- Purchase two KiPro KiStor500-R0 500-gigabyte hard drives for each remote site (total of 8 for the remote sites).
- Viewsonic VT602L monitor (smaller preferred-maybe Marshall mlynx 702) with Raxcess NAM1T rack mount if needed. Feed this monitor from the HDMI or component output of the existing cable box.

Notes:

- A. Mica computer is too deep for existing rack. Consider using a Middle Atlantic PTRK-1426MDK with rear rails and shelf to hold the Mica computer frame, or other suggestions here.
- B. Can place Broadcast Pix control panel on the wood table to the left of the equipment rack.
- C. Can use Vesa monitor stands to hold the two VGA/DVI Broadcast Pix monitors. Should measure space for monitor size. You can use 17" to 24" monitors in this space.
- D. All equipment listed must be the same or better quality
- E. System integration and design
- F. Please reuse any racks/tables that you can repurpose in the new control area.

City Hall Hoover Room, Waltham City Hall, 610 Main St.

- (3) Panasonic AW-HE60SN/SE camera, cables, batteries, and adapters
- Broadcast Pix Flint V3 LS with 500 panel all controls, monitors, cables and adapters. We will use this as our camera control unit. The LS series has balanced analog audio output, which is preferred (but unbalanced input). Flint switcher has a delay of 6 frames (200ms). Must pass mixer balanced audio through IHF-Pro interface to Flint to match video delay, then to audio DA for recording.
- AJA KiPro Portable Recorder
- Sony VRDMC6 DVD burner fed by Flint composite output and Aphex IHF-Pro converters.
- Shure SCM810 8 Channel Auto mixer
- (3) Vaddio 999-8860 Acoustic Echo Canceling ceiling mics
- Mic stand
- Bigfoot JR 12-14RU mobile cart (other suggestions considered). Shure mixer KiPro, DVD recorder and Broadcast Pix computer can be mounted below. Optional connector panels can be ordered via Bigfoot, or a snake can possibly be coiled up in the rear of the cart for storage

- Black Burst reference generator with four outputs. Blackmagic Designs CONVMSYNC or similar. One output feeds the Flint reference in; the other three feed the camera BBS inputs.
- Henry Engineering Matchbox HD IHF to Pro interface to convert the Shure mixer balanced output to unbalanced to feed the Flint input.
- Ensemble Designs rack mount kit BERKMT or similar.
- Ensemble Designs Brighteye Individual Power Supplies as needed or similar.
- 2x Aphex 120B Audio DA or similar. Distributes mixer program to KiPro analog in and DVD recorder (set output gain for feed to DVD recorder FCCW for 10db loss. Use XLR to RCA adapter cable to feed recorder).
- Aphex rack mount kit for 120B or similar.
- Purchase two KiPro KiStor500-R0 500-gig hard drives for each remote site (total of 8 for the remote sites).
- System integration and design

Notes:

- G.** Flint switcher has a delay of 6 frames (200ms). Must pass mixer balanced audio through IHF-Pro interface to Flint to match video delay, then to audio DA for recording.

Auditorium, Government Center, 119 School St.

- (3) Panasonic AW-HE120SN/SE cameras, cables, batteries, and adapters
- Broadcast Pix Flint V3 LS with 500 panel all controls, monitors, cables and adapters. We will use the Flint as our camera control unit. The LS series has balanced analog audio output, which is preferred (but unbalanced input). Flint switcher has a delay of 6 frames (200ms). Must pass mixer balanced audio via IHF-Pro interface through Flint to match video delay, then to audio DA for recording.
- AJA KiPro Portable Recorder
- Sachtler 5199 Combi Pedestal
- Sachtler 1006 dv10 Fluid pan/Tilt head
- Snake custom RoboCam Snake – 100'
- Florescent lights (There are historical preservation requirements in this room. We feel its best for bidders to see the room and choose the lighting that they feel is best.)
- Black Burst reference generator with four outputs. Blackmagic Designs CONVMSYNC or similar. One output feeds the Flint reference in; the other three feed the camera BBS inputs.
- Henry Engineering Matchbox HD IHF to Pro interface to convert the Shure mixer balanced output to unbalanced to feed the Flint input.
- 2x Aphex 120B Audio DA or similar. Distributes delayed mixer program to KiPro analog in and DVD recorder (set output gain for feed to DVD recorder FCCW for 10db loss. Use XLR to RCA adapter cable to feed recorder).
- Aphex rack mount kit for 120B or similar.
- Purchase two KiPro KiStor500-R0 500-gig hard drives for each remote site (total of 8 for the remote sites).
- 100-foot camera snake that contains HD-SDI cable, Ethernet, and power for new camera on tripod. Sheath with Flexo-Wrap PET or similar.
- Checkers Industrial FLX1x4 Fastlane Drop Over Protector 4", GG3X225 or similar.
- Add wall I/O plate on wall of control room for the new tripod-based camera.
- (3) 1-Channel Fastlane Drop-Over Protector (4")

- All monitors, cables, racks and materials
- System integration and design
- Re-organize room layout (see note K. Other suggestions considered)

Notes:

- H. Re-use existing Shure SCM810 mixer.
- I. Repair bad audio lines from stage left to control room. A few are noisy.
- J. Re-use Extron video DA for NTSC distribution.
- K. Re-organize room layout. Move rack closer to rear left corner while keeping access to the rear to allow room for new furniture for the Broadcast Pix control room that will be facing the inside wall. Add cable hook for the third camera snake on the inside wall by the door.

Government Center Meeting Room (Basement), 119 School St.

- (2) Panasonic AW-HE60SN/SE camera, cables, batteries, and adapters
- Broadcast Pix Flint V3 LS with 500 panel all controls, cables and adapters. We will use the camera control unit to control our cameras. Flint switcher has a delay of 6 frames (200ms). Must pass mixer balanced audio through IHF-Pro interface to Flint to match video delay, then to audio DA for recording. Sony DVD recorder is fed by Flint composite output and Aphex IHF-Pro converters
- AJA KiPro Portable Recorder
- Shure SCM810 8 Channel Auto mixer (the mics we have should be fine, but they do need new audio cables)
- Bigfoot JR 12-14RU mobile cart (or better suggestion). Determine if Shure audio mixer location in rack rails below is a reasonable location. Optional connector panels can be ordered via Bigfoot, or a snake can possibly be coiled up in the rear of the cart for storage.
- Sony VRDMC6 DVD Burner
- Black Burst reference generator with four outputs. Blackmagic Designs CONVMSYNC or similar. One output feeds the Flint reference in; the other three feed the camera BBS inputs.
- Henry Engineering Matchbox HD IHF to Pro interface to convert the Shure mixer balanced output to unbalanced to feed the Flint input.
- 2x Aphex 120B Audio DA or similar. Distributes mixer program to KiPro analog in and DVD recorder (set output gain for feed to DVD recorder FCCW for 10db loss. Use XLR to RCA adapter cable to feed recorder).
- Aphex rackmount kit for 120B or similar.
- Purchase two KiPro KiStor500-R0 500-gig hard drives for each remote site (total of 8 for the remote sites).
- All monitors, cables, racks, custom wall plate(s) and materials
- System integration and design

Cannon Lecture Hall, Waltham High School, 617 Lexington St.

- (3) Panasonic AW-HE120SN/SE cameras, cables, batteries, and adapters
- Broadcast Pix Mica with 1000 Panel all controls, cables and adapters. We will use the Mica to control the cameras.
- AJA KiPro Portable Recorder
- Sony VRDMC6 DVDirect Compact Size DVD Burner with AVCHD Recording
- Shure SCM810 8 Channel Auto mixer
- 8 Shure MX412S C/S/N_12 inch (30.5 cm), Attached Preamp, Mute Switch 12 inch gooseneck

- (2) Sony KDL70R550A 70" TV for front walls of room
- (2) Sony KDL32W650A 46" for columns for viewing from stage
- (2)LED-L large Security Mounts for 70" TV
- (2)LED-S small security mounts for 46" TV
- Ensemble Designs BE41 analog DA or similar. For Black burst distribution from reference output of Broadcast Pix Mica to the four Panasonic cameras.
- Re-use Extron analog Video DA for distribution of analog NTSC program from the Ensemble Designs BE920M HD-SDI to analog NTSC converter.
- Ensemble Designs BE920M HD-SDI to analog NTSC converter or similar.
- Ensemble Designs rack mount kit BERKMT or similar.
- Ensemble Designs Brighteye Individual Power Supply (3 required) or similar.
- 2x Aphex 120B Audio DA or similar. Distributes mixer program to KiPro analog in and DVD recorder (set output gain for feed to DVD recorder FCCW for 10db loss. Use XLR to RCA adapter cable to feed recorder.
- Aphex rack mount kit for 120B or similar.
- Distribution of video to each stage or wall monitor (4). Suggest converting guest computer VGA or DVI video output to HDMI. Then distribute to front displays and control room. Use two 50-foot HDMI cables from HDMI DA run on the floor from presenter's desk to each display.
- Computer video to SDI conversion. Can use KanexPro HDVGARL VGA to HDMI converter or similar. Feed 1x4 HDMI DA. Can use Kramer VM-4HXL or similar. Use HDMI extender to control room. Possibly use Extron DTP HDMI 230 Tx, DTP HDMI 230 Rx, and Extron XTP DTP 24 shielded twisted pair cable, or comparable products. Need scan converter that converts VGA, DVI, or HDMI to SDI. Possibly use Kramer VP790 presentation converter or similar.
- For streaming encoder, can possibly use Teradek Cube Teadek Vidiu or Epiphan VGADVI broadcaster or other simple to operate device that feeds Apple HLS and RTMP h.254 to local Wi-Fi in the room and web page-possibly YouStream. Optionally a Teradek Cube decoder can be used in the control room to feed the switcher instead of the cabled feed.
- Purchase two KiPro KiStor500-R0 500-gig hard drives for each remote site (total of 8 for the remote sites).
- Rack and furniture (see note F below).
- Viewsonic VT602L monitor or smaller with Raxcess NAM1T rack mount if needed. Feed this monitor from the HDMI or component output of the existing cable box.
- Planning and cabling for mic muting system. Copy City Hall Chambers installation.
- All monitors, cables, racks and materials
- System integration and design

Notes:

- L. The school control room requires a layout update. Here we suggest that either an equipment rack be added in the front right inside corner, where the Broadcast Pix computer, KiPro, DVD recorder, video DA, conversion, scan converter as well as the NTSC fiber converter can be located. The current cabinet would be removed and a production desk be installed in its place where the Broadcast Pix control panel and VGA/DVI monitors can be located. Alternatively the current cabinet can be re-used for the new rack equipment provided that proper cooling could be added and the Broadcast Pix control panel and monitors be placed on new furniture placed against the right wall. Options considered.
- M. Re-use Shure mixer.
- N. Computer HDMI can be extended with CAT-5 extenders to the school control room to feed the SDI scan converter and a streaming PC.

Installation and Training to be included

- Vendor must provide loaner equipment within 48 hours in case of a warranty service repair.
- Installation must be done by manufacturer or certified technicians of vendor and may not be subcontracted to parties who are not certified by the vendor. Full as-built system wiring documentation must be provided.

2. Video Playback Server

400 Main Street, Waltham MA

- Telvue B1000 HyperCaster playback system with integrated VOD and Live Streaming
- 3 SD channels and 1 HD channel
- Web accessible Graphic User Interface for content upload, program scheduling and content management
- Minimum of 11 TB storage
- Ability to play SD or HD content
- Server scalable to playback 20 channels of SD or 10 channels of HD in one appliance
- Real time up/down format conversion for SD and HD files, depending on output
- Cloud-based content acquisition with transcoding, meta data creation and scheduling integration
- True down stream graphics for bugs, crawls and lower thirds
- Encoders for 9 sources
- Internal capture of live steaming signal
- Support of legacy router integration
- 5 years of technical support
- VOD
- Virtually unlimited number of users
- Content management through web interface
- Content upload integrated with content playback
- Embeddable web browser for content organization
- Live Stream
- Integrated with playback system
- Provide multiple streaming formats including HLS for iOS devices, MPEG2-TS, H.264TS/RTMP, HDS
- Support 4 live streams simultaneously
- All VOD content and Live Streaming available on Roku
- Multi-viewer for return signal monitoring
- 50 inch screen
- Minimum of 9 channels on display
- Display includes audio levels
- Near Line Storage-NAS
- Integrated with playback system from content retrieval
- Minimum of 18TB storage, expandable to 36
- Battery Power Backup
- Rack Unit for equipment
- Cabling, installation and training for all equipment
- System must be currently airing an HD channel in Massachusetts on either RCN, Comcast or Verizon

- Authorized dealer or manufacturers must install all video playback server equipment
 - Tightrope Carousel Digital System (HD) must be integrated into the HD Channel
 - WCAC, MAC, and WETV Tightrope Carousel Digital Systems will be integrated into the new playback system. All playback equipment for the High School TV Studio will now be housed at WCAC
 - All current content on WCAC/MAC/WETV must be downloaded onto the new system
 - Schematics for the playback system must be provided to WCAC
 - Must purchase HD converter box from RCN.
 - 1 EH 24A Encoder Host
 - 1 HDE 24 HD Encoder Card
 - 2 SDE 24 Dual SD Encoder Cards
- Danny Hartsoe is the contact at RCN danny.hartsoe@rcn.net

Playback Racks:

Middle Atlantic VRK series racks (possibly VRK-44-36H if this fits in the room and is deep enough for the deepest equipment) or similar can be installed in the office to the right of the current equipment racks. No tops or rear doors are needed, and only two sides for each end. Rear rails for those racks that will hold the servers and storage. Install two Middle Atlantic power strips in the rear of each rack. One will be for UPS while the other is for direct power. The racks should be bolted to the floor and bolted together. All racks should be grounded to a single separate earth ground for "signal ground". Install blank panels and track lighting. As HD distribution is installed, HD monitors (or TV's) should be installed in the rack area.

A single UPS system should be installed to keep alive any mission critical equipment (i.e. the playback servers, storage and encoders). This UPS should be rated for at least double the full-calculated load and batteries be able to be swapped with the system in operation. Consider a UPS bypass switch for easier future replacement of the unit.

HVAC improvements should be installed to handle at least twice the calculated heat load. Suggest two units for redundancy if possible as if the HVAC goes down; equipment can be permanently damaged by heat.

New equipment installation should occur in the new rack room. This will allow for installation of new systems without affecting the current operation. Once the new equipment is online, the old racks can be cleared of the old gear. These racks than then be wired to the UPS, HVAC added to the area and new equipment growth can be accommodated as needed.

Please note that all HVAC and electrical work will be done by a city contractor. The winning bid will have to work with the city to make sure the HVAC and electrical are upgraded to meet the needs of the new playback server.

3. WCAC Control Room and Studio – Overview

400 Main Street

We are upgrading our current Slate 1000 Broadcast Pix switcher to Mica 1000. The current hardware can be upgraded. We also need to upgrade our studio cameras. We want change our current teleprompter program to a Macintosh based system. All Teleprompter hardware can be repurposed. We need to add lights and another panel of cyclorama to our studio. Our lights, and cyc were purchased by High Output. We need you to order the exact lights and cyc listed on the bid. We will also be upgrading our tripods.

The following list of equipment fits the specs that we want for our studio/control room. All equipment must meet the specs of the equipment listed or better.

- (3) Sony HXC-D70 Camera(s) all cables, brackets, viewfinders, control units, power supplies, lens, lens control, memory cards and tally.
- (3) Sony HXCU-D70 CCU
- Upgrade from Slate 1000 Broadcast Pix to Mica all controls, monitors, cables, power supplies and adapters
- 2 VGA/DVI Monitors (HP Pavillion 23XI or similar) for Slate.
- BrightEye 56 HD/SD/Analog Test Signal and Sync Pulse Generator or similar
- (3) 737 Miller Pedestal with Miller Arrow 55
- (3) 692 Miller Pan Arm
- (2) KI PRO RACK AJA Digital Recorder/Converter
- (2) KI STOR 500 AJA 500 GB Removable Drive
- SNK164XL100 100' 16 x 4 XLR to Box audio snake
- LV5380 Leader Waveform/Vectorscope or similar (Blackmagic Ultrascope Duo can be considered if funds are tight)
- HD5DA AJA 1:4 HD Distribution Amplifier
- PVM1741A Sony 17" OLED Studio/Production Monitor
- 4 CQ - CHCF48CYCRGBA - Color Force 48 LED CYC Fixture (*David Seneca, High Output DSeneca@highoutput.com*)
- 8 ETC - 400CC - Pipe Clamp RB - Cyclorama Panel: 9'-6" high x 15' wide, IFR Grey Poly Cyc, sewn flat, with Webbing Grommets and
- S-Hooks on 12" ctrs top, 2" side hems, lined bottom hem with chain.
- We would like to repurpose one of our older Macs for our teleprompter. (we will purchase the software) Our current hardware can be reused. We will need new cabling/Adapters to the Mac from the cameras.
- RTS TW intercom to camera interface (just cabling). This should be cabled to the CCU Intercom TW inputs.
- (3)VIZIO 42" Class LCD TV
- Black Burst DA if not already existing.
- All monitors, cables, racks, power supplies and materials
- System integration and design

Notes:

- A. Studio scan converter to SDI for computer feeds. If a dedicated computer is used at a fixed 1920x1080 59.94hz display rate, an Aja HA5 HDMI to SDI scan converter or similar can be used.
- B. Aphex Compellor 323 audio leveler at line output of audio mixer can be added to help control levels (purchase used).
- C. Add the two outputs of the Broadcast Pix systems to the Shure audio mixers for clip playback.
- D. A single-line conceptual drawing should be created to verify signal flow and needed building blocks.
- E. Detailed CAD system drawings should be created and approved before installation begins.

- F. As-built system drawings that accurately reflect actual installation should be provided.
- G. In the future, NTSC fiber backhaul and SD program circuits can be replaced with SDI, ASI or IP-based fiber circuits. If IP-based backhaul is used, file based delivery from these remote sites can be incorporated.

4. Field Equipment

The following list of equipment fits the specs that we want for our field equipment. All equipment must meet the specs of the equipment listed or better.

- (3) Sony PMW300K1 Three 1/2" Exmor CMOS XDCAM HD422 Memory Semi-Shoulder Handy Camcorder
- (6) BP-U90 Rechargeable Lithium-ion Battery Pack
- (2) Sony BCU2 Battery Charging units
- (3) Sennheiser MKE 600 Shotgun Microphone
- (3) Sennheiser MZH 600 Windshield
- (2) Sennheiser ME 66 Shotgun Microphone
- (2) Sennheiser MZW 66 Windshield
- Sony SxS-1 Memory Cards - 32GB (8)
- Sony SxS-1 Memory Cards - 64GB (6)
- (2) Genaray LED-7100T 312 LED Variable-Color On-Camera Light
- (3) Canon XF105 HD Professional Camcorder
- (3) BP-975 Intelligent Lithium-Ion Battery Pack (7350 mAh)
- TriCaster 460 – adapters, power supply, cables, monitoring
- Shure SCM410 4-Channel Automatic Mixer
- (3) 100 FT SDI cables
- Behringer EUROPORT EPA300
- (2) GOPRO HERO3+ Black Edition
- (3) iPad 2 16 GB Black
- (2) RCA 19" Class LED-LCD 720p 60Hz HDTV, (1.8" ultra-slim) LED19B30RQ
- (3) Atomos Ninja 2 Video Recorder
- (2) SanDisk Extreme II Internal SSD (480GB)
- (2) MediaStation™ 16x External BDXL Blu-Ray Burner
- 7 Burner 14X CD DVD BD Blu-ray Duplicator + 500GB & USB Multiple Tower Copier
- (9) Sony SBAC-US20 USB 3.0 SxS Memory Card Reader/Writer
- VIZIO 47" Class Razor LED™ Smart TV
- (6) Sony MDR7506 Professional Large Diaphragm Headphone
- Apantac DE. This unit has 8 HDMI/DVI inputs and outputs either HDMI or Ethernet

Correction of all system interconnectivity or signal flow issues as well as accurate detailed system as-built diagrams for all government spaces, the studio/control room and the video playback system must be provided to Maria Sheehan, Executive Director before final payment will be made.

City Hall Chambers and Cannon Lecture Hall

Internal Processing and operation system:

HD 4-4-4 YPrPb, 10 bit 1080i

Integrated rack mountable Server with Microsoft Windows 7 O/S.

I/O

8 external HD-SD/SDI video inputs without the use of additional conversion.

6 SDI Outputs including: 1080i Program, 1080i Clean Feed, Multi Def (720P or SD) Program, Multi Def Clean Feed, 1080i Preview, and 1080i "Power Aux"

Program and Preview DVI outputs at 1920x1080

Switcher

Tactile control panel With 3 axis joystick and fader arm

Classic next transition architecture

Switchable 4:3/16:9 Operation

Switchable 50/59.94hz Operation

Async support for all SDI inputs

Aspect Ration Control (ARC) available for all inputs

ARC available for SD outputs

6 levels of key each with independent DVE for each

Chroma key of any input

Snapshot and sequential memories of all system functions, including switcher status, graphics and clips.

Graphics

Integrated dual channel character generator, with pre-loaded templates, rolls and crawls.

Dynamic Speed adjustment of Rolls and Crawls

Integrated dual channel still store with key.

Edit Graphics on the fly.

Integration to external Databases

Integration to Twitter

Clip and Animation Stores

Integrated HD Clip Store with Stereo Audio. Minimum of 4 hours (250Gb) at highest quality level

Native codec support ProRes, H.264 and DNxHD

Clip start can be initiated by switcher transition.

Clips can be trimmed.

Clips can loop.

Clips can automatically Advance

Mix 720P, 1080i and SD Clips

Mix 4:3 and 16:9 Clips

Communication and control

Single point of operation for solo operator control of all switcher and integrated functions.

Expandable from single operator to collaborative operation.

Distant control of all functions through web browser.

Remote control of all functions from iPad

Ability to remotely control Panasonic PTZ cameras directly from panel. Includes:

Pan, Tilt and Zoom with 3 axis joystick.
Focus and Iris control with knobs
Display adjustments on physical and soft panels

Monitoring

support for Dual 1920x1080 DVI Displays
supports touch screen control of all functions
Multiple Preview, Program, Clean feed and Aux output windows
4:3, Title Safe and Center Graticules for output windows
Multiple External and Internal Source windows
Tally and mnemonic support for all inputs
File Names on Internal Source Windows
Completely Customizable Multi-View layouts. Includes ability to independently size and position all source and output windows across both monitors.
Multiple Clocks
Countdown Clocks
Key Status display with full motion, tally and modification status
Monitor all graphic libraries.
Monitor all clip libraries.

Redundancy

Fail over input to Program output
Failsafe control of application via GUI
Optional Redundant power for Control Panel

Training

Factory Certified trainers and installation

Hoover Room (City Hall) Basement Government Center and Auditorium Government Center Internal Processing and operation system:

1080i internal processing
Integrated rack mountable Server with Microsoft Windows 7 64 bit OS.

I/O

All without the use of external conversion
4 external HD-SD/SDI video inputs
2 HDMI inputs
HD-SDI Program Output
HDMI Program Output
Analog Composite and Component Program Outputs

Switcher

Tactile control panel With 3 axis joystick and fader arm
Classic next transition architecture
Switchable 4:3/16:9 Operation
Switchable 50/59.94hz Operation
3 levels of key each with independent DVE for each
Chroma key of any input

Snapshot and sequential memories of all system functions, including switcher status, graphics and clips.

Graphics

Integrated dual channel character generator, with pre-loaded templates, rolls and crawls.

Integrated dual channel still store with key.

Edit Graphics on the fly.

Clip and Animation Stores

Dual Integrated HD Clip Store with Stereo Audio. Minimum of 2 hours at highest quality level

Native codec support ProRes, H.264, DNxHD, and Quicktime Animation

Clip start can be initiated by switcher transition.

Clips can be trimmed.

Clips can loop.

Clips can automatically Advance

Recording

Internal Motion JPEG recording of Program

Streaming

Internal Adobe Flash or Microsoft Expression streaming encoder

Communication and control

Single point of operation for solo operator control of all switcher and integrated functions.

Expandable from single operator to collaborative operation.

Distant control of all functions through web browser.

Remote control of all functions from iPad

Ability to remotely control Panasonic PTZ cameras directly from panel. Includes:

Pan, Tilt and Zoom with 3 axis joystick.

Focus and Iris control with knobs

Display adjustments on physical and soft panels

Monitoring

support for Dual 1920x1080 DVI Displays

supports touch screen control of all functions

Multiple Preview, Program, Clean feed and Aux output windows

4:3, Title Safe and Center Graticules for output windows

Multiple External and Internal Source windows

Tally and mnemonic support for all inputs

File Names on Internal Source Windows

Completely Customizable Multi-View layouts. Includes ability to independently size and position all source and output windows across both monitors.

Multiple Clocks

Countdown Clocks

Key Status display with full motion, tally and modification status

Monitor all graphic libraries.

Monitor all clip libraries.

Redundancy

Fail over input to Program output

Failsafe control of application via GUI

Optional Redundant power for Control Panel

Training

Factory Certified trainers and installation

City Hall Chambers, Cannon Lecture Hall, and Government Center

Cameras

Power Requirements: DC 12 V $\pm 10\%$ (AC adaptor provided)

Power Consumption: 1.75 A

Weight Approx. 3.0 kg (Approx. 6.6 lb) (including the mount brackets)

Dimensions (W x H x D): 180 mm x 228 mm x 220 mm (7.1 inches x 9.0 inches x 8.7 inches) (excluding protrusions, cable cover, direct ceiling mount brackets)

Camera:

Image Sensors: 1/3 progressive 2.2 megapixel, 3MOS sensor

Lens: Motorized 20x zoom, F1.6 to F3.4 (f=4.5 mm to 90 mm, 35 mm equivalent: 32.13 mm to 6452.5 mm)

Focus Distance: Entire zooming range: 800 mm, Wide end: 400 mm

Output Format: 1080/59.94p*1, 1080/59.94i, 720/59.94p, 480/59.94p*1, 480/59.94i, 1080/50p*1, 1080/50i, 720/50p, 576/50p*1, 576/50i

Synchronization System: Internal/External synchronization (BBS/3SY)

Pan-tilt Mechanism:

Installation Method*2: Stand-alone (Desktop) or suspended (Hanging) *To ensure safety, AW-HE120 must be secured by using the mount bracket provided.

Pan/Tilt Operation Speed: Max 60°/sec.

Pan Range: $\pm 175^\circ$

Tilting Range*3: -30° to 210° * Depending on the pan or tilt position, AW-HE120 may be reflected in the image.

Quietness: NC35

Preset Positions: 100

I/F: IP/RS422

Footnote: *1 When 1080/59.94p, 1080/59.94i and 576/50p are selected, output signals on SDI and analog component are 1080/59.94i, 1080/50i, 480/59.94i and 576/50i respectively.

*2 For safety purpose, the included mounting, bracket must be used for installation.

*3 The camera may be subject to external glare, depending on the pan and tilt position.

Hoover Room, City Hall and Basement Government Center

Cameras

Power Requirements: DC 12 V (AC adaptor supplied)

Power Consumption: 1.3 A (AW-HE60H), 1.4 A (AW-HE60S)

Weight: Approx. 1.4 kg (Approx. 3.1 lb) without mount bracket

Dimensions (W x H x D): 160 mm x 178 mm x 166 mm (6-5/16 inches x 7 inches x 6-9/16 inches) (excluding protrusions, cable cover, direct ceiling mount bracket)

Image Sensors: 1/3 type Full-HD MOS

Lens: Motorized 18x zoom, F1.6 to F2.8

(F=4.7 mm to 84.6 mm, 35 mm equivalent: 36.9 mm to 664.5 mm)

Focus Distance: Entire zooming range: 1.0m (3.3 ft.), Wide end: 30 cm (0.98 ft.)

Output Format: 1080/59.94p*1, 1080/59.94i, 1080/29.97PsF, 720/59.94p,
480/59.94p*1, 480/59.94i, 1080/50p*1, 1080/50i,
1080/25PsF, 720/50p, 576/50p*1, 576/50i

Synchronization System: AW-HE60S: Internal/External synchronization (BBS)

AW-HE60H: Internal/External synchronization

Installation Method*2: Stand-alone (Desktop) or suspended (Hanging)

Pan/Tilt Operation Speed: Max 90°/s

Pan Range: ± 175°

Tilt Range*3: 90° to -30°

Quietness: NC35 (at normal speed), NC40 (when preset)

Preset Positions: 100

Input/Output Connector: RJ-45 (IP) /RD422A (MULTI-IF)

Footnote: *1 When 1080/59.94p or 1080/50p mode is selected, a progressive signal is output through HDMI OUT, and an interlace signal is output through analog component OUT and SDI OUT. When 480/59.94p or 576/50p mode is selected, a progressive signal is output through HDMI OUT (AW-HE60HN/HE only) and analog component OUT, and an interlace signal is output through SDI OUT (AW-HE60SN/SE only).

When IP images distributed, component signals (480/59.94i, 576/50i) are not output through multi-interlace.

*2 For safety purpose, the included mounting bracket must be used for installation.

*3 Depending on the pan or tilt position, the camera may shoot itself

Internal Processing and operation system specs:

HD 4-4-4 YPrPb, 10 bit 1080i

Integrated rack mountable Server with Microsoft Windows 7 O/S.

I/O

8 external HD-SD/SDI video inputs without the use of additional conversion.

6 SDI Outputs including: 1080i Program, 1080i Clean Feed, Multi Def (720P or SD) Program, Multi Def Clean Feed, 1080i Preview, and 1080i "Power Aux"

Program and Preview DVI outputs at 1920x1080

Switcher

Compatible with existing Broadcast Pix 1000 panel, or panel capable of the following:

Graphic files names on source and library buttons

Clip file names on source and library buttons

Tactile control panel With 3 axis joystick and fader arm

Classic next transition architecture

Switchable 4:3/16:9 Operation

Switchable 50/59.94hz Operation

Async support for all SDI inputs

Aspect Ration Control (ARC) available for all inputs

ARC available for SD outputs

6 levels of key each with independent DVE for each

Chroma-key of any input

Snapshot and sequential memories of all system functions, including switcher status, graphics and clips.

Graphics

Integrated dual channel character generator, with pre-loaded templates, rolls and crawls.

Dynamic Speed adjustment of Rolls and Crawls

Integrated dual channel still store with key.

Edit Graphics on the fly.

Integration to external Databases

Integration to Twitter

Clip and Animation Stores

Integrated HD Clip Store with Stereo Audio. Minimum of 4 hours (250Gb) at highest quality level

Native codec support ProRes, H.264 and DNxHD

Clip start can be initiated by switcher transition.

Clips can be trimmed.

Clips can loop.

Clips can automatically Advance

Mix 720P, 1080i and SD Clips

Mix 4:3 and 16:9 Clips

Communication and control

Single point of operation for solo operator control of all switcher and integrated functions.

Expandable from single operator to collaborative operation.

Distant control of all functions through web browser.

Remote control of all functions from iPad

Monitoring

support for Dual 1920x1080 DVI Displays

supports touch screen control of all functions

Multiple Preview, Program, Cleanfeed and Aux output windows

4:3, Title Safe and Center Graticules for output windows

Multiple External and Internal Source windows

Tally and mnemonic support for all inputs

File Names on Internal Source Windows

Completely Customizable Multi-View layouts. Includes ability to independently size and position all source and output windows across both monitors.

Multiple Clocks

Countdown Clocks

Key Status display with full motion, tally and modification status

Monitor all graphic libraries.

Monitor all clip libraries.

Redundancy

Fail over input to Program output

Failsafe control of application via GUI

Optional Redundant power for Control Panel

Training

Factory Certified trainers and installation

Sony Camera Specs.

Camera Specifications Detail:

Built-In Optical Filters ND filters:1: CLEAR, 2: 1/4ND, 3: 1/16ND, 4: 1/64ND

Dynamic Range 600%

Effective Picture Elements 1920x1080

Gain Selection -3,0,+3,+6,+9,+12db

Horizontal Resolution 1,000 TV lines or more (in 1920 x 1080i mode) 920 TV lines (in SD mode)

Lens Mount Standard 2/3" B4 Bayonett mount

Modulation Depth NA

Optical System F1.4 Prism system

Pickup Device 3-chip 2/3-inch type Exmor Full-HD CMOS

S/N Ratio HD 59db, SD 65db (Y=Typical)

Sensitivity "F12 (typical) (1920 x 1080/59.94i mode), F13 (typical) (1920 x 1080/50i mode) (at 2000 lx, 3200 K, 89.9% reflectance)"

Servo Filter Control NA

Shutter Speed 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000

General Specifications Detail:

Application Studio/Field operation

Dimensions (W x H x D) 144 (5 3/4)W,314 (12 3/8)D,223 (8 7/8)H, in mm and inches

Format 1920 \diamond 1080/59.94i, 50i 1280 \diamond 720/59.94P, 50P"

Imager 2/3-inch type Exmor Full-HD CMOS

Mass Main body only: 3.4 kg (7 lb 7.9 oz)

Operating Temperature !!10 fC to +45 fC (14 fF to 113 fF)

Power Consumption Approx. 1.92 A/12v Main unit (camera) + LCD viewfinder + auto focus lens + microphone"

Power Requirements 12 V DC (10.5 V to 17.0 V)

Storage Temperature !!20 fC to +60 fC (!!4 fF to 140 fF)

Weight Main body only: 3.4 kg (7 lb 7.9 oz)

Input Connectors Specifications Detail:

Audio Input XLR 3-pin (x2, at front panel and rear panel)

DC IN XLR 4-pin (x1)

Genlock/Return IN BNC (x1), 1 Vp-p, 75 $\text{L}\odot$

Microphone Input XLR 3-pin (x2, at front panel and rear panel)

Return Control Return switch and assignable switches

Input/Output Connectors Specifications Detail:

CCU 26 MULTI PIN CONNECTER(CCZA/CCZAD cable connector)

Intercom XLR 5-pin, female (x1)

Lens 12-Pin(x1)

Prompter BNC (x1), 1 Vp-p, 75 $\text{L}\odot$

Remote 8-pin (x1)

Viewfinder Digital interface (x1) and DXF type analog interface (x1)

Inputs and Outputs Specifications Detail:

Audio In XLR 3-pin (x2, at front panel and rear panel)

Audio Out NA

Camera Adaptor NA

DC In XLR 4-pin (x1)
 DC Out 4-pin (x1)
 Earphone Mini-jack 3-pin (x1)
 Ethernet NA
 Genlock In BNC (x1), 1 Vp-p, 75 Ω
 HD-SDI Out (Dual Link) BNC (x1)
 Lens 12-Pin(x1)
 MIC In XLR 3-pin (x2, at front panel and rear panel)
 Memory Stick Memory Stick DUO
 Remote 8-pin (x1)
 SDI In BNC (x1)
 Test Out BNC (x1)
 USB NA
 Video Out Test out/SDI OUT
 i.LINK NA
 Output Connectors Specifications Detail:
 DC OUT 4-pin (x1)
 HD SDI Out BNC (x1)
 Headphone Output XLR 5-pin, female (x1)
 Test OUT BNC (x1)

Sony PMW300K1 Camera Specs

Built-in Optical Filters 1: Clear, 2: 1/4ND, 3: 1/16ND, 4: 1/64ND
 Effective Picture Elements 1920 (H) x 1080 (V)
 Gain -3, 0, 3, 6, 9, 12, 18 dB, AGC
 Horizontal Resolution 1,000 TV lines or more (1920 x 1080i mode)
 Imaging Device 3-chip 1/2-inch type Exmor Full HD CMOS
 Minimum Illumination 0.02 lx (typical) (1920 x 1080/59.94i mode, F1.9, +18 dB gain, with 64-frame accumulation, Gamma on, 50% video level)
 Optical System F1.6 prism system
 S/N Ratio 60 dB (Y) (typical)
 Sensitivity (2000 lx, 89.9% reflectance) F11 (typical) (1920 x 1080/59.94i mode)
 Shutter Speed (Time) 1/32 sec to 1/2,000 sec
 Slow & Quick Motion Function 720p : selectable from 1 fps to 60 fps as recording frame rate
 1080p : selectable from 1 fps to 30 fps as recording frame rate
 Slow Shutter 2, 3, 4, 5, 6, 7, 8, 16, 32, and 64-frame accumulation
 White Balance Preset (3,200 K), Memory A, Memory B/ATW
 General Specifications Detail:
 Battery Operating Time Approx. 3.6 hrs with BP-U90 battery (while recording, with viewfinder, I/O Select Off)
 Built-in Microphone Omni-directional stereo electret condenser microphone.
 Dimensions (W x H x D) 10 7/8 x 9 1/2 x 15 1/8 inches (275 x 239 x 384 mm)
 Mass body : 4 Lb 14 oz (2.2 kg)
 Operating Temperature 32°F to 104°F (0°C to 40°C)
 Power Consumption Approx. 20 W (while recording, with viewfinder, IO Select Off)
 Power Requirements DC 12 V
 Recording Format [VIDEO]
 XAVC (future option)

MPEG-2 Long GOP :

- HD 422 mode: CBR, 50 Mbps max., MPEG-2 422P@HL
- HQ mode: VBR, 35 Mbps max., MPEG-2 MP@HL
- SP mode: CBR, 25 Mbps, MPEG-2 MP@H-14
- SD mode : MPEG IMX, DVCAM

[AUDIO : UDF]

- HD 422 50 mode: LPCM 24 bits, 48 kHz, 4 channels
- HD 420 HQ mode: LPCM 16 bits, 48 kHz, 4 channels
- SD MPEG IMX mode: LPCM 16/ 24 bits, 48 kHz, 4 channels
- SD DVCAM mode: LPCM 16 bits, 48 kHz, 4 channels

[AUDIO : FAT]

- HD mode: LPCM 16 bits, 48 kHz, 4 channels
- SD DVCAM mode: LPCM 16 bits, 48 kHz, 2 channels

Recording Frame Rate [UDF]

HD 422 50 Mode : MPEG-2 422P@HL, 50 MBps/ CBR

- 1920 x 1080 / 59.94i, 50i, 29.97p, 25p, 23.98p
- 1280 x 720 / 59.94p, 50p, 29.97p, 25p, 23.98p

HD 420 HQ Mode : MPEG-2 MP@HL, 35 MBps/ VBR

- 1920 x 1080 / 59.94i, 50i, 29.97p, 25p, 23.98p (requires version Up)
- 1440 x 1080/ 59.94i, 50i, 29.97p, 25p, 23.98p,
- 1280 x 720 / 59.94p, 50p, 23.98p (2-3 pull down)

SD MPEG IMX Mode

- 720 x 480 / 59.94i, 29.97PsF
- 720 x 576 / 50i, 25PsF

[FAT]

HD 420 HQ Mode : MPEG-2 MP@HL, 35 Mbps/ VBR

- 1920 x 1080/ 59.94i, 50i, 29.97p, 25p, 23.98p
- 1440 x 1080/ 59.94i, 50i, 29.97p, 25p, 23.98p
- 1280 x 720/ 59.94p, 50p, 29.97p, 25p, 23.98p

HD SP 1440 Mode: MPEG-2 MP@H-14, 25 Mbps/ CBR

- 1440 x 1080/ 59.94i, 50i, 23.98p (2-3 pull down)

SD DVCAM Mode

- 720 x 480/ 59.94i, 29.97PsF
- 720 x 576/ 50i, 25PsF

Recording/Playback Time [UDF]

HD 422 50 / SD MPEG IMX Mode :

- Approx. 120 min with SBS-64G1A (64 GB) memory card
- Approx. 60 min with SBP-32/ SBS-32G1A (32 GB) memory card
- Approx. 30 min with SBP-16 (16 GB) memory card

HD 420 HQ Mode :

- Approx. 180 min with SBS-64G1A (64 GB) memory card
- Approx. 90 min with SBP-32/ SBS-32G1A (32 GB) memory card
- Approx. 45 min with SBP-16 (16 GB) memory card

SD DVCAM Mode :

- Approx. 220 min with SBS-64G1A (64 GB) memory card
- Approx. 110 min with SBP-32/ SBS-32G1A (32 GB) memory card
- Approx. 55 min with SBP-16 (16 GB) memory card

[FAT]

HD HQ Mode :

- Approx. 200 min with SBS-64G1A (64 GB) memory card
- Approx. 100 min with SBP-32/ SBS-32G1A (32 GB) memory card
- Approx. 50 min with SBP-16 (16 GB) memory card

HD SP Mode :

- Approx. 280 min with SBS-64G1A (64 GB) memory card
- Approx. 140 min with SBP-32/ SBS-32G1A (32 GB) memory card
- Approx. 70 min with SBP-16 (16 GB) memory card

SD DVCAM Mode :

- Approx. 260 min with SBS-64G1A (64 GB) memory card
- Approx. 130 min with SBP-32/ SBS-32G1A (32 GB) memory card
- Approx. 65 min with SBP-16 (16 GB) memory card

Storage Temperature -4°F to +140°F (-20°C to +60°C)

Inputs/Outputs Specifications Detail:

Audio Input XLR-type 3-pin (female) (x2), line/mic/mic +48 V selectable

Composite Output VIDEO OUT: BNC type

DC Input DC jack

Genlock Input BNC (x1) (switchable to Video out), 1.0 Vp-p, 75Ω

HDMI Output A-type (x1)

Headphone Output Stereo mini-jack (x1)

Lens Remote 8-pin, round

Remote 8-pin

SDI Output BNC (x2), HD-SDI/SD-SDI selectable

Speaker Output Monaural

Timecode Input BNC (x1) (switchable to TC out) (SMPTE 12M-2-2008 standard, 0.5V-1.8Vp-p, 10kΩ)

Timecode Output BNC (x1) (switchable to TC in) (SMPTE 12M-2-2008 standard, 1.0Vp-p, 10kΩ)

USB USB 2.0 (device), mini-B type (x1) USB Host, Type A (x1)

Video Output BNC x1, (switchable to Genlock In), HD-Y / Composite switchable, 1.0 Vp-p, 75Ω

i.LINK IEEE-1394, 4-pin, (x1), HDV (HDV 1080i) / DV input/output, S400

Lens Specifications Detail:

Filter Diameter M77 mm, pitch 0.75mm

Focal Length 5.8-81.2mm (35mm Equiv: f=31.4mm-439mm)

Iris F1.9-F16 and Close

Lens Mount 1/2-type EX mount

Zoom Ratio Optical 14x

Media Specifications Detail:

Type ExpressCard/34 slot x 2

Monitoring Specifications Detail:

Built-in LCD Monitor 3.5-inch type color LCD monitor : 960 (H) x 3(RGB) x 540 (V), Quarter HD Size

Canon XF105 Camera Specs

Image Device 1/3" CMOS Sensor

2.37MP (2.07MP effective)

Lens 10x HD Zoom

4.25-42.5mm (30.4-304mm, 35mm equivalent)

f/1.8-2.8

58mm Filter Diameter

Horizontal Resolution 900 TV lines or more
Focusing System TVAF plus External Phase Difference Metering Sensor
Autofocus (Instant AF, Medium AF, Normal AF, Face AF, Face Only AF), Manual, Full Manual
Minimum Illumination 4.5 lux (full AUTO mode, 1/60 shutter speed, +24dB gain)
1.6 lux (Manual mode, 1/4 shutter speed, +33dB gain)
Built-in Filters Neutral Density (Auto or Off)
Minimum Focus Distance 20mm (wide macro), 60cm (entire zoom range)
Video Recording System Compression: MPEG-2 Long GOP
Color Space: 4:2:2 (at 50Mbps recording)
File Format: MXF

Recording Modes:

50Mbps (CBR) 4:2:2, 1920x1080, (60i/30p/24p),
1280x720 (60p/30p/24p)
35Mbps (VBR) 4:2:0, 1920x1080 (60i/30p/24p),
1280x720 (60p/30p/24p)
25Mbps (CBR) 4:2:0, 1440x1080 (60i/30p/24p)
Audio Recording Format 2-Channel, PCM digital recording, 16-Bit; 48kHz
Frame Rates 60i, 60p (720p mode only), 30p, 24p 1
Image Stabilization SuperRange Optical (Lens Shift) 4 modes: Standard, Powered, Dynamic, Off
LCD Monitor 3.5" Color, approx. 920,000 dots
Viewfinder 0.24" Color, approx. 260,000 dots
Microphone Stereo electret condenser microphone
Memory Card Slot CF Card: 2 Slots (movie files only)
SD Card: Still images, Custom Picture Data, Clip Metadata, Custom Settings
Shutter Speed Max 1/2000
White Balance Auto, Manual, Custom (2000K - 15000K in 100K increments), Daylight, Tungsten
Gain Selection Not specified by manufacturer
Maximum Recording Time 64GB Compact Flash (CF) card
(Greater capacity is possible when two cards are used.)
25Mbps: 310 minutes
35Mbps: 225 minutes
50Mbps: 160 minutes
Input and Output Connectors HD/SD-SDI: BNC (x1 Output)
Component (x1 Output)
Composite: 3.5mm A/V (x1 Output), BNC (x1 Output)
HDMI: Standard Type A (x1 Output)
Mic/Line: XLR 3-pin (x2 Input)
USB: Mini-B USB 2.0
Headphone: 3.5mm Mini
Genlock: BNC (x1 Input)
Timecode: BNC (x1 Input, x1 Output)
Remote Control Terminal: LANC
Power Requirements 7.4VDC (Battery Pack)
Power Consumption Not specified by manufacturer
Operating Temperature 32-104°F (0-40°C), 85% relative humidity
Dimensions (WxHxD) 4.8 x 5.8 x 9.8" (12.1 x 14.8 x 25 cm)
Weight 2.4 lbs (1.08kg) - not including battery, memory card, lens hood, mic holder

Tricaster 460

Connection Diagram

[click for a larger view](#)

Switcher Channels 15 – 6 external, 5 internal, 4 M/E buses

Video Input 4 simultaneous live video sources, in any combination of supported connection types, resolutions and frame rates (including PsF selections)

Direct input of cameras and video devices in any combination of HD-SDI, HD Component, SD-SDI, SD Component, Y/C or Composite connections

Per-input format configuration, scaler (including 3:2 intelligent pull-down) and frame synchronizer enabling intermixing of formats

Per-input color correction, crop and LiveMatte keyer controls

Support for Key + Fill input pairing

Network Sources 2 live inputs via Gigabit connection, selectable from any available network sources with support for video, audio and alpha channel

Supported sources include networked computers via included NewTek iVGA client application; wireless Apple® AirPlay® devices; TriCaster 8000, 860, 460 or 410; 3Play 4800, 820 or 425; USB video sources; video over IP sources; RTMP or RTSP streams; HTTP streaming video sources; and a variety of third-party partner solutions

Robotic Camera Support Access up to 4 live Pan-Tilt-Zoom (PTZ) robotic cameras via standard serial and network protocols, with preset system and user interface control over camera orientation, zoom, focus and iris

Media 4 integrated digital media sources for video, graphics and sounds (2 DDRs, GFX and Sound) + 15 buffers

Buffers 15 content buffers to store and playback video, animations, still images and graphics

5 animation buffers and 10 still & title buffers, with multiviewer, animation preview, title editing and presets

Shareable across a network for watch folder application, with real-time edit and update of content

Mix/Effect Buses (M/E) 4 freely configurable M/E channels for video mixing, compositing, effects and virtual sets, each with independent Key layer and support for TransWarp effects

Mix mode: Enables secondary switcher operation for output, submix or recording, with Program/Preview workflow and transitions

Effects mode: Enables multi-layer compositing, effects generation and virtual set application, with per-source 3D DVE, scaling, cropping and keying

Macros Record configurations and operation sequences, then attach to keyboard shortcuts, control surface actions, MIDI controllers, or on-screen hotspots for recall and automation

Macro editor for modifying user-defined macro configurations and sequences

Augment and extend TriCaster operation using macro plug-ins to control external devices

DSKs 2 primary DSK channels, plus 1 additional Key layer per M/E bus, each with independent transition controls, 3D DVE, scaling, cropping and integrated TransWarp effects

Effects and Transitions Integrated TransWarp effects engine on all effects channels supports standard transitions, customizable animation store transitions with audio, and overlay effects

Animation Store Creator for custom animations

Supports per-pixel alpha blending between sources and real-time 3D warping of video or graphics

Virtual Sets 30+ HD live virtual sets, with presets, multiple camera angles, real-time reflections, and specular highlights

Live pan and zoom of virtual camera and customizable virtual camera presets with animated pan, zoom and pedestal moves

Support for up to 2 switchable live sources, with per-source 3D DVE, scaling, cropping and keying

Supports custom-created virtual sets generated using NewTek Virtual Set Editor or third-party partner solutions

Holographic Live Virtual Sets Support for custom virtual environments generated from panoramic smartphone, camera or DSLR images

Select sets included; custom sets require Virtual Set Editor 2.5

Hotspots Up to 8 freely configurable, interactive hotspots per input for macro control

Video Output Configurable for up to 9 output connections, with support for key output and per-connection signal settings

2 x SDI

2 x Analog (configurable for Component or Y/C + Composite)

HDMI output

Network output for live streaming

A/V output to network-connected TriCaster over local network

Recording Multi-track, multi-format recording of up to 4 simultaneous channels via IsoCorder™ technology

Native recording in up to 1080p with timecode

Encoding format selectable from: QuickTime® (XDCAM HD compatible, 4:2:2 encoding, 24-bit audio), MPEG-2 (high or normal profile), AVI (SpeedHQ), and H.264 (high or Web quality)

Freely choose to add recordings to Publish queue and DDR destinations

Grab Grab full resolution, de-fielded still images from inputs and outputs, and freely choose to add grabs to Publish queue, Media Player presets and Buffer destinations

Media Publishing Supports direct content upload to YouTube™, Facebook, Twitter™, FTP, local or external volumes, and network servers

Live Streaming HD live streaming with simultaneous archive

Presets in up to 720p, supporting most common streaming profiles and custom multi-bitrate streaming profiles, including RTMP streaming using H.264 (ex. Adobe® Flash® Media Server), Microsoft® Windows

Media® Push/Pull, and browser-based streaming applications, with Ustream® and Livestream® native integrated support

Streaming Profile Manager with integrated Web browser

Audio Inputs 4 SDI Embedded

3 x 2 Balanced 1/4" (Mic/Line)

1 x 2 Balanced XLR (Mic/Line)

Phantom Power Support

Audio Outputs 2 SDI Embedded

1 x 2 Balanced XLR

1 x 2 Balanced 1/4" (AUX)

1 Stereo 1/4" (phones)

Audio Mixing Integrated multi-channel audio mixer for internal and external audio sources, outputs, stream and headphones, with 4 fully independent stereo output mixes: 2 Master, 2 AUX

Pan control, solo auditioning, seven-band equalizer and stereo compressor/limiter per input and output, with per-input audio delay control

Multi-bus routing of audio source channels to any combination of outputs, with independent level control over channels 1/2 and 3/4 for quad sources

Audio Follow Video system enabling audio to follow multiple video sources, with support for unlimited audio grouping combinations

Digital audio inputs equipped with audio time-base synchronizers

Supports companion iPad® audio mixing app and Avid® Artist Mix audio control surface

Supported Session Formats

NTSC model: 1080/30p, 1080/24p, 1080/60i, 720/60p, 720/30p, 720/24p, 480/60i

Multi-Standard model: NTSC 1080/30p, 1080/24p, 1080/60i, 720/60p, 720/30p, 720/24p, 480/60i; NTSC-J 1080/30p, 1080/24p, 1080/60i, 720/60p, 720/30p, 720/24p, 480/60i; PAL 1080/25p, 1080/24p, 1080/50i, 720/50p, 720/25p, 720/24p, 576/25i

Playback Media Formats AVI, DV, DVCPro, DVCProHD, FLV, F4V, H.263, H.264, MOV, MKV, MJPEG, MPEG (1, 2, all profiles, program or transport streams), MP4, WMV, WebM, PSD, PNG, TGA, BMP, JPEG, EXR, RAW, TIF, AIFF, MP3, WAV, and more, with Import Media application for batch import with optional transcoding of files (including Apple ProRes)

Export Media Formats Export media application for batch copying with optional transcoding of files to compatible formats for different applications and devices: Apple ProRes, AVI, DV, DVCPro, DVD, H.264, MOV, MPEG-2, MJPEG, MP4, WebM and more

Post Production

NewTek SpeedEDIT 2 non-linear editor available via download for Add-On installation

NewTek SpeedHQ codecs for Mac and PC included for extended file compatibility

Monitoring DVI and HDMI monitor outputs for user interface and multiview displays

Preview all sources or select sources in a variety of layouts and dual-monitor display combinations via Workspaces control panel

A/V indicator and guide overlays configurable per viewport

Signal Monitoring Integrated Waveform and Vectorscope, full field rate with digital calibration, color preview and support for ITU-R Rec. 601 and 709

Session Management Setup and store session settings in reusable template sessions

Latency

Ultra-low, between 1 and 2 frames

Processing Video: 4:4:4:4, 32-bit Floating Point

Audio: 4 channels, 96 kHz, 32-bit Floating Point

A/V Standards HD-SDI video conforms to SMPTE 292M

SD video conforms to SMPTE 259M and ITU-R BT.656

Analog audio levels conform to SMPTE RP-155

Control Surface Optional TriCaster 460 hardware control surface

Surface ~ 23.5 x 0.5 x 11.6 in (59.7 x 1.3 x 29.5 cm)

Base ~ 22.5 x 2.0 x 10.8 in (57.2 x 5.1 x 27.4 cm)

14.6 lbs (6.6 kg)

MIDI Control Support for standard MIDI protocol enabling third-party MIDI device control of TriCaster operations via macros

System Physical 2U Rack Mount, with 430W power supply and multi-tiered hardware and software fail-safe

19.0 x 3.5 x 21.5 in (48.3 x 8.9 x 54.6 cm)

26 lbs (11.8 kg)

EUROPORT EPA300

Ultra-Compact 300-Watt 6-Channel Portable PA System with Digital Effects and FBQ Feedback Detection

Ultra-compact 300-Watt, 6-channel portable PA system

Enormous power, incredible sonic performance, and super-light weight means no more lugging around dead weight

Extremely powerful 8" woofers and 1.35" aluminum-diaphragm compression drivers for incredible sound reproduction

Studio-grade 24-bit stereo FX processor with 100 awesome presets including reverb, chorus, flanger, delay, pitch shifter and various multi-effects

Revolutionary FBQ Feedback Detection system instantly reveals critical frequencies for easy feedback removal

6-channel mixer section features 2 mono and 2 stereo channels plus separate CD inputs

2 high-quality mic preamps with switchable +48 V phantom power for condenser microphones

Effective, extremely musical 2-band EQ, switchable Pad and Clip LEDs on all mono channels

Stereo 5-band graphic EQ allows precise frequency correction of main outputs

Voice Canceller function removes singer's voice from recordings for Karaoke applications

Comes with one BEHRINGER XM1800S microphone, mic clip and 20' cables

Integrated storage compartment for microphone, cables, and accessories

"Planet Earth" switching power supply for maximum flexibility (100 - 240 V~), noise-free audio, superior transient response plus low power consumption for energy savings

High-quality components and exceptionally rugged construction ensure long life

END OF SECTION

Compliance

(Required Documents.)

Compliance

The compliance documents in this section must be completed, signed and returned with your bid package.

Purchasing Department

City of Waltham
610 Main Street
Waltham, MA 02452

Failure to submit the completed documents will cause the disqualification of the proposal.

Section Index

Check when Complete

- Non-collusion form and Tax Compliance form..... _____
- Corporation Identification Form..... _____
- Certificate of Vote Authorization..... _____
- CORI background Check _____
- Certificate of Insurance (showing all limits of WC &GL)..... _____
- Three (3) References..... _____
- 5%) Bid Bond or Certified Check..... _____
- Debarment Certificate _____
- Prevailing Wage Certificate..... _____
- Right-to-know Law..... _____
- OSHA 10 Certificate for all Assigned Employees (MGL ch30, §39M and Ch 149) _____

Before the commencement of the Job, the contractor must provide to the above office:

- Performance Bond for 100% of the contract value and naming the City of Waltham
(Letter must be included with your response)

Your Company's Name: _____

Service or Product Bid _____

NOTE: Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

NON-COLLUSION FORM AND TAX COMPLIANCE FORM

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity or group of individuals. The undersigned certifies that no representations made by any City officials, employees, entity, or group of individuals other than the Purchasing Agent of the City of Waltham was relied upon in the making of this bid

_____, _____
(Signature of person signing bid or proposal) Date

(Name of business)

TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c. 62C, & 49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

_____, _____
Signature of person submitting bid or proposal Date

Name of business

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

CERTIFICATE OF VOTE OF AUTHORIZATION

Date:

I _____, Clerk of _____ hereby certify that at a meeting of the Board of Directors of said Corporation duly held on the _____ day of _____ at which time a quorum was present and voting throughout, the following vote was duly passed and is now in full force and effect:

VOTED: That _____ (*name*) is hereby authorized, directed and empowered for the name and on behalf of this Corporation to sign, seal with the corporate seal, execute, acknowledge and deliver all contracts and other obligations of this Corporation; the execution of any such contract to be valid and binding upon this Corporation for all purposes, and that this vote shall remain in full force and effect unless and until the same has been altered, amended or revoked by a subsequent vote of such directors and a certificate of such later vote attested by the Clerk of this Corporation.

I further certify that _____ is duly elected/appointed _____ of said corporation

SIGNED:

(Corporate Seal)

Clerk of the Corporation:

Print Name: _____

COMMONWEALTH OF MASSACHUSETTS

County of _____

Date:

Then personally appeared the above named and acknowledged the foregoing instrument to be their free act and deed before me, _____

Notary Public;

My Commission expires: _____

CORPORATION IDENTIFICATION

The bidder for the information of the Awarding Authority furnishes the following information.

If a Corporation:

Incorporated in what state _____

President _____

Treasurer _____

Secretary _____

Federal ID Number _____

If a foreign (out of State) Corporation – Are you registered to do business in Massachusetts?

Yes _____, No _____

If you are selected for this work you are required under M.G.L.ch. 30S, 39L to obtain from the Secretary of State, Foreign Corp. Section, State House, Boston, a certificate stating that you Corporation is registered, and furnish said certificate to the Awarding Authority prior to the award.

If a Partnership: (Name all partners)

Name of partner _____

Residence _____

Name of partner _____

Residence _____

If an Individual:

Name _____

Residence _____

If an Individual doing business under a firm's name:

Name of Firm _____

Name of Individual _____

Business Address _____

Residence _____

Date _____

Name of Bidder _____

By _____

Signature _____

Title _____

Business Address _____ (POST OFFICE BOX NUMBER NOT ACCEPTABLE)

City

State

Telephone Number

Today's Date

CORI CHECK VERIFICATION

NOTICE TO ALL CONTRACTORS

ALL CONTRACTORS AWARDED A CONTRACT MUST PROVIDE THE WALTHAM PURCHASING DEPARTMENT WRITTEN CONFIRMATION OF ITS FULL COMPLIANCE WITH M.G.L. CHAPTER 71, SECTION 38R, WHICH REQUIRES CORI CHECKS FOR ALL SCHOOL EMPLOYEES AND VOLUNTEERS, AS WELL AS ANY AND ALL CONTRACTORS OF ANY KIND, OR LABORERS WHO PERFORM WORK ON SCHOOL GROUNDS, AND WHO MAY HAVE DIRECT AND UNMONITORED CONTACT WITH CHILDREN PLEASE SIGN BELOW TO INDICATE THAT THE ABOVE MASSACHUSETTS GENERAL LAW HAS BEEN ADDRESSED BY YOUR COMPANY.

PLEASE SIGN BELOW TO INDICATE THAT THE ABOVE MASSACHUSETTS GENERAL LAW HAS BEEN ADDRESSED BY YOUR COMPANY

COMPANY NAME: _____

ADDRESS: _____

Signature _____, Date _____

Print Name _____, Title _____

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

PROVIDE THREE (3) SERVICE APPROPRIATE REFERENCES

1. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

2. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

3. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package will be cause for the disqualification of your company.

WEEKLY PAYROLL RECORDS REPORT & STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided, A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

In addition, every contractor and subcontractor is required to submit, on a weekly basis, a copy of his or her weekly payroll records to the awarding authority. For every week in which an apprentice is employed, a photocopy of the apprentice's identification card must be attached to the payroll report. Once collected, the awarding authority is also required to preserve those reports for three years.

In addition, each such contractor, subcontractor, or public body shall furnish to the awarding authority directly, within fifteen days after completion of its portion of the work, a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

_____, 200_____

I _____, _____
(Name of signatory party) (Title)

I do hereby state that I pay or supervise the payment of the persons employed by

_____ on the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____, Title _____

Print _____

RIGHT TO KNOW LAW

Any vendor who receives an order or orders resulting from this invitation agrees to submit a Material Safety Data Sheet (MSDS) for each toxic or hazardous substance or mixture containing such substance, pursuant to M.G.L. c. 111F, §§8,9 and 10 and the regulations contained in 441 CMR 21.06 when deliveries are made. The vendor agrees to deliver all containers properly labeled pursuant to M.G.L. c. 111F §7 and regulations contained in 441 CMR 21.05. Failure to furnish MSDS and/or labels on each container may result in civil or criminal penalties, including bid debarment and action to prevent the vendor from selling said substances, or mixtures containing said substances within the Commonwealth. All vendors furnishing substances or mixtures subject to Chapter 111F or M.G.L. are cautioned to obtain and read the laws, rules and regulations referenced above. Copies may be obtained from the State House Bookstore, Secretary of State, State House, Room 117, Boston, MA (617) 727-2834.

Authorized Signature Indicating Compliance with the Right-to-know laws:

Signature

Date

Print Name

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

DEBARMENT CERTIFICATION

In connection with this bid and all procurement transactions, by signature thereon, the respondent certifies that neither the company nor its principals are suspended, debarred, proposed for debarment, declared ineligible, or voluntarily excluded from the award of contracts, procurement or non procurement programs from the Commonwealth of Massachusetts, the US Federal Government and /or the City of Waltham. "Principals" means officers, directors, owners, partners and persons having primary interest, management or supervisory responsibilities with the business entity. Vendors shall provide immediate written notification to the Purchasing Agent of the City of Waltham at any time during the period of the contract of prior to the contract award if the vendor learns of any changed condition with regards to the debarment of the company or its officers. This certification is a material representation of fact upon which reliance will be placed when making the business award. If at any time it is determined that the vendor knowingly misrepresented this certification, in addition to other legal remedies available to the city of Waltham, the contract will be cancelled and the award revoked.

Company Name _____

Address _____

City _____, State _____, Zip Code _____

Phone Number (____) _____

E-Mail Address _____

Signed by Authorized Company Representative:

Print name _____,

Date _____

10 HOURS OSHA TRAINING CONFIRMATION

Chapter 306 of the Acts of 2004

CONSTRUCTION PROJECTS

AN ACT RELATIVE TO THE HEALTH AND SAFETY ON PUBLIC

The undersigned hereby certifies that all employees to be employed at a worksite for construction, reconstruction, alteration, remodeling, repair, installation, demolition, maintenance or repair of any public work or any public building estimated to cost more than \$10,000.00 have successfully completed a course in construction safety and health approved by the **United States Occupational Safety and Health Administration** that is at least **10 hours** in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first payroll report for each employee and will comply with all laws and regulations applicable to awards of subcontracts subject to section 44F.

Company Name: _____

Address: _____

Signature: _____

Title: _____

Print Name: _____

Date: _____

See Chapter 306 of the Acts of 2004

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package will be cause for the disqualification of your company.

Request for Taxpayer Identification Number and Certification

Give Form to the
requester. Do not
send to the IRS.

Fill Out This
Section

Print or type
See Specific Instructions on page 2.

| | |
|--|--|
| Name (as shown on your income tax return) | |
| Business name/disregarded entity name, if different from above | |
| Check appropriate box for federal tax classification: <input type="checkbox"/> Individual/sole proprietor <input type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <input type="checkbox"/> Other (see instructions) ▶ _____ | |
| <input type="checkbox"/> Exempt payee | |
| Address (number, street, and apt. or suite no.) | Requester's name and address (optional) Chief Procurement Officer Purchasing Department, City of Waltham 610 Main Street Waltham, MA 02452 |
| City, state, and ZIP code | |
| List account number(s) here (optional) | |

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

| | | | | | | | | |
|--------------------------------|--|--|--|---|--|--|--|--|
| Social security number | | | | | | | | |
| | | | | - | | | | |
| Employer identification number | | | | | | | | |
| | | | | - | | | | |

Fill out this sect.
either SS or FID

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
- I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here
Signature of
U.S. person ▶

Date ▶

Sign & Date

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
- Certify that you are not subject to backup withholding, or
- Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

BID PRICE FORM

(Follows)

Price Form.

The price quoted below shall be inclusive of all expenses such as overhead and profit, travel expenses, administrative support cost, mobilization to and from the project, and all other expenses. The price quoted below is a fixed, not to exceed price **AND INCLUSIVE OF UNLIMITED TRAINING**, AS REQUESTED.

COST OF EQUIPMENT: \$ _____

COST OF MATERIALS: \$ _____

COST OF INSTALLATION & ENGINEERING: \$ _____

GRAND TOTAL: \$ _____

NAME OF YOUR COMPANY: _____

AUTHORIZED SIGNATURE: _____

PRINT NAME: _____

TITLE: _____

DATE: _____

MAC-TV Government Spaces

Room Layout Reference Guide

City Hall – City Hall Chamber

Additional 4th camera to add



Podium
With mic

← Council Seats ->
each has their own mic

Lower table for wireless mics

→
Production
Rack on this
side

City Council Podiums with mics

Projector Screen



City Hall – Hoover Room

door

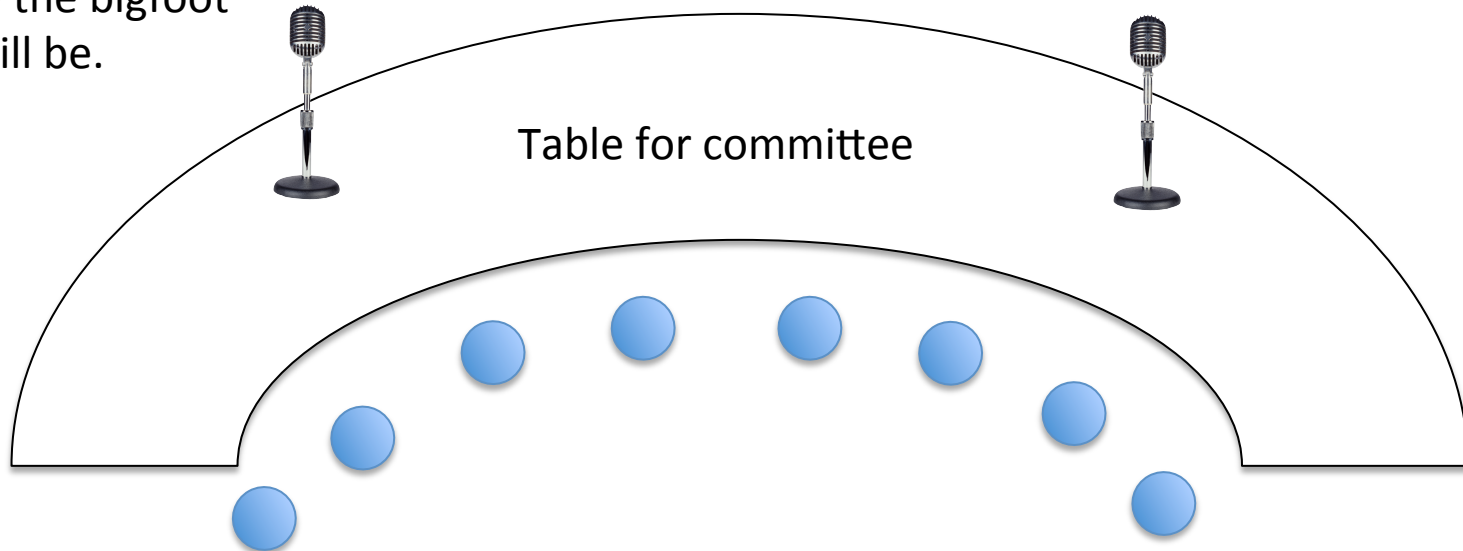
door

Microphones should be hanging from the ceiling. There should be a patch in the wall to connect audio and video near where the bigfoot cart will be.

seats

Bigfoot
Production
cart

Table for committee



Government Center - Auditorium

All mics are gooseneck with the exception of 2 wireless handhelds. Lighting must be considered for this room, but have to adhere to historical standards.

Production Room – same as city hall rack – audio different

Additional 3rd camera to add on pedestal for movability



seats



seats



Podium
With gooseneck
mic

table

PA audio in
back room

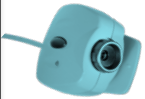
Stage for meetings – audio from gooseneck wired microphones set up for each meeting.
Note: Some boards sit at table in front of stage

Audio wall
patch located
here →

Government Center – Public Meeting Room

Production Rack Setup
– should be similar to
Hoover Room but
won't have size
constraint. Either
lockable rack or cart
we can secure
somewhere

Microphones
should be a 3-4
PZMs on table and
one gooseneck on
podium. They
should patch into
wall
←here



door

seats

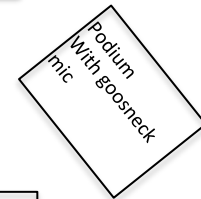


Table where board sits

Cannon Lecture Hall – High School

Production Room – Same set up as City Hall Chamber with different audio

door

door



seats

Third camera placement to be determined with best set up for room and presentations. This might mean an adjustment of where current cameras are located as well.



Podium
With mic

Monitors*

Monitors*

*Monitors will only be showing anything from the projector, not video feed.

Stage for School Committee
All wired gooseneck microphones